

Tucson Small Business Recycling Research and Pilot Project

Final Report

**Submitted to US EPA
RCRA 8001 Grant No. X1- 989487 01 – 3**

Submitted by

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March 30, 2004

December 6, 2004 revision

30% post consumer recycled content paper

Executive Summary

The City of Tucson, Arizona has a population of 514,720. City of Tucson Environmental Services (ES) collects residential refuse and recycling via side loading automated plastic containers (APC). Commercial refuse and recycling is collected via front load metal dumpsters. Smaller commercial businesses that generate less refuse use the residential size APCs. The small businesses using APCs were the target customers of this pilot project. ES conducted the Small Business Recycling Pilot Project from 1999 to 2002 to assist small businesses in blue barrel commingled single stream recycling, and to better understand their waste stream and the recycling potential of the targeted businesses. This project led the way for all qualifying small businesses in Tucson (2100) to recycle with blue barrels when residential blue barrel collection began citywide.

The project followed three phases: Phase one was selection of 30 APC businesses on which waste audits and blue barrel audits were performed; Phase two expanded to 172 APC businesses; and Phase three consisted of monitoring container set-outs, fullness and contamination as well as further blue barrel audits. Phase three ended with exit interviews of the businesses regarding their experience in the pilot. Findings are as follows:

- Initial confusion over what and when to recycle led to a 25% contamination rate of the blue barrels.
- Steady education of participants led to a decrease in contamination to 5%.
- Businesses became more efficient over time in setting out containers only when near full, countering a decrease in set out rates from 64.5% to 52.3% with an increase in fullness from 69% to 86% and the route (172 businesses) yielded an increase from 2,919 pounds to 3,277 pounds per week.
- During phase one 9.9 tons of material was recycled from 29 project businesses over 20 months. During phases two 84.7 tons was recycled from 172 businesses over one year. With all APC customers (2,100) now able to recycle we estimate that about 1,032 tons per year is being diverted from the waste stream from this source alone.
- The diversion of this material contributed to the reduction of greenhouse gas emission and an energy savings of 18,665 BTUs
- Businesses had little or no problem in making the transition from twice per week garbage collection to once per week because they had been recycling for over a year when the transition came.
- Up-front education and planning are important in getting new customers to be successful recyclers.

Introduction Scope and Methodology

The City of Tucson applied for and received an EPA research and pilot recycling grant in 1999 to assist small businesses receiving City of Tucson trash service to reduce waste and increase recycling, and to research the issues of waste generated from small businesses.

The City of Tucson Environmental Services (ES), formerly the Solid Waste Management Department, collects garbage and recyclables from 135,000 households each week via 90, 65, or 300-gallon plastic refuse containers (APCs) collected by an automated, side loading collection vehicle, and collects waste from over 3,600 larger commercial accounts via front load metal dumpsters. ES also collects garbage from 2,100 small businesses that use the 90 and 300-gallon APCs. Since the City has converted to the single stream blue barrel recycling system the waste diversion rate has gone from under 9% to over 22% citywide, with some neighborhoods achieving 30% diversion.

The larger commercial accounts can recycle via front load metal recycling dumpsters, but until the Tucson Recycles blue barrel collection program was implemented, beginning in 2002, the small businesses could only recycle by taking their material to the 16 Neighborhood Recycling Centers (NRC) in Tucson.

Previously ES had conducted a Small Business Assistance Program that provided internal recycling bins, information, and referral to the NRCs . The program had also established contacts with the Tucson Metro Chamber of Commerce, the Hispanic Chamber of Commerce, The Small Business Commission, and *Inside Tucson Business* (a weekly business newspaper). These contacts, as well as other print, radio, and television media have been used to explain the pilot project methodology and results. In the third month of this project a “Compilation of Successful Strategies Employed by other Communities” was submitted to EPA.

The EPA Small Business Pilot consisted of three phases. Phase one was recruitment of 30 small businesses that fit the requirement of using ES APC garbage service. This was done by mailings and visits to qualifying businesses in a preselected geographic area of Tucson during the summer of 2000. The 30 businesses were given 60 or 90-gallon blue barrels in early October and recycling diversion began. The following items were listed for collection:

- Corrugated Cardboard
- Newspaper
- Mixed Office Paper and Mail
- Magazines and Catalogs
- Chipboard/Paperboard (added after initial audits)
- Aluminum and Tin Cans
- #1 and #2 Plastic Bottles and Jugs
- Glass Bottles and Jars

Businesses were given self-audit information and forms but few businesses filled them out. Phase one also consisted of waste audits on the 30 businesses in September and October 2001, and blue barrel recycling audits in October and December. ES staff conducted ongoing setout, container fullness, and contamination of blue barrels. The original 30 businesses became 29 when one business dropped out shortly after the study began. Ten of the original businesses are offices such as insurance, law, and publishing; nine are small retail stores; seven are light manufacturing such as automotive service; and three are food service related. In order to keep the collection route as short as possible the area was limited to the northwest quadrant of Tucson. This area was slightly enlarged for phase two, the expansion of participant businesses that occurred in the summer of 2001. Phase two consisted of recruitment by mailings to potential participants in late 2000 and early 2001. All participants were volunteers. The route expanded from 29 to 172 in June 2001, as well as collection going from every other week to weekly. The route for the collection of these recyclables was expanded from two hours every other week to seven hours, weekly. This limitation kept the program from expanding to up to 300 businesses as had originally been desired.

In phase three more data on recycling set-outs, container fullness, and contamination was collected, recycling container audits were conducted, and finally in the Fall of 2003, exit interviews were conducted on participating businesses as the entire City of Tucson side load APC residential and small businesses had converted to once per week garbage and recycling collection.

Findings from Audits and Set-out Data Collection

The initial waste audits showed that garbage was 73.5% by weight and 63.5% by volume with recyclables at 26.5% by weight and 36.5% by volume (Table 1).

Table 1 Waste Audits 30 Business Garbage (9/21/00 – 10/2/00) four collection dates

Totals	Pounds	%	Gallons	%
OCC/Corrugated Cardboard	402.2	6.91 %	1,758.5	21.32 %
ONP, Phone books, Magazines	443.0	7.61 %	274.1	3.32 %
Office Paper	398.7	6.85 %	461.5	5.59 %
Subtotal Paper	1,234.9	21.36 %	2,495.1	30.23 %
Containers (plastic, aluminum, glass)	131.0	2.25 %	329.4	3.99 %
Subtotal Containers	131.0	2.25 %	329.4	3.99 %
Food Organic	283.5	4.87 %	100.7	1.22 %
Garbage	4,163.2	71.52 %	5,330.9	64.57 %
Subtotal Garbage & Food	4,446.7	74.14 %	5,431.6	65.79 %
Total	5,821.6	100.00 %	8,256.1	100.00 %

A commercial waste characterization study done in 1993 by the University of Arizona Garbage Project on front load metal garbage dumpsters showed the corrugated cardboard fraction of the waste to be higher (Table 2).

Table 2 Waste Audit Univ. of Arizona Garbage Project (1993)

Commodity	%WT
OCC – Corrugated Cardboard	15.8%
ONP, Telephone Books, Magazines	5.0%
Office Paper	9.2%
Subtotal Paper	30%
Containers (plastic, aluminum, glass)	6.1%
Subtotal Containers	6.1%
Recyclables	36.1%
Food	17.3%
Garbage	46.6%
Subtotal Garbage & Food	63.9%
Total	100%

In October the initial blue barrel recycling collection material was audited using a similar methodology as the waste audit. On October 12 the audit revealed that 28.9 % by weight and 37.5% by volume was non-recyclable contamination. The 29 businesses were contacted regarding the contaminants found during the audits, which included, Federal Express envelopes (Tyvek), Plastic bags and film, Copy Paper Ream Wrappers, Automotive fluid containers, and Styrofoam Cups. Blue barrel audits done in November and December showed that the contamination rate was reduced to around 5% (Graph 1)

Table 3 Detailed Blue Barrel Recyclable Audits (by weight, **pounds**)

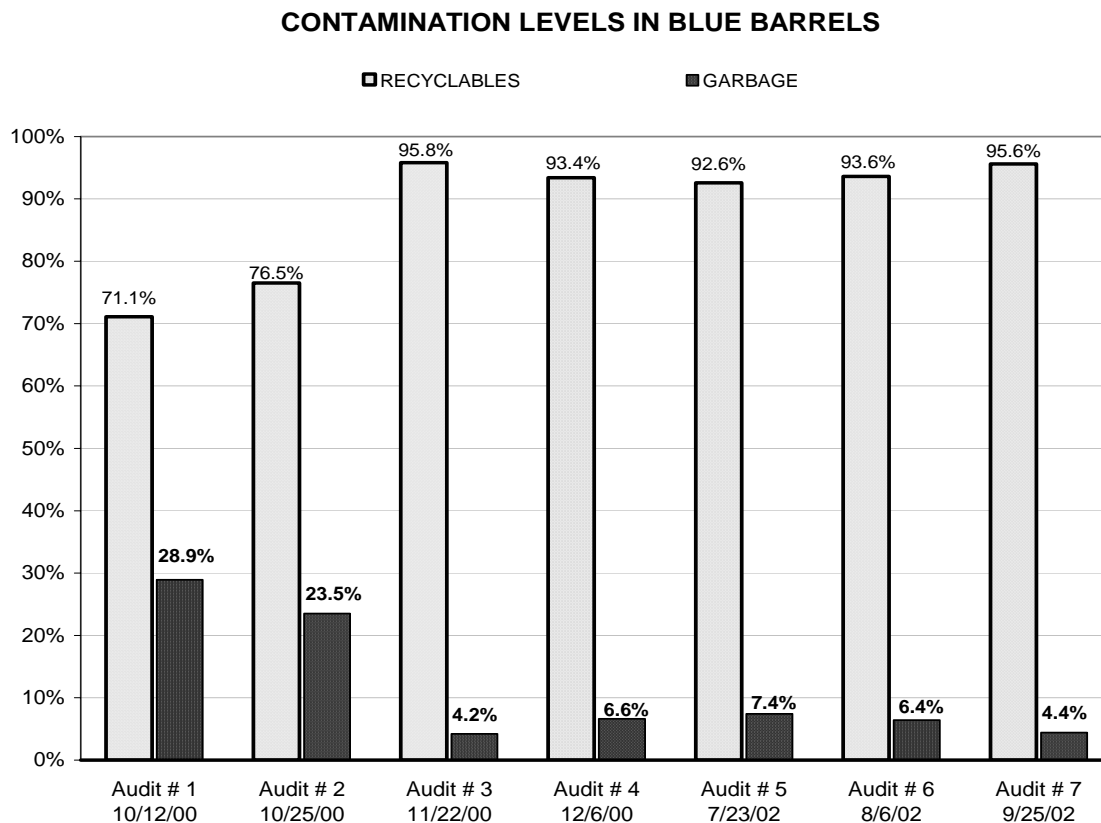
Audit →	# 1 10/12/00	# 2 10/25/00	# 3 11/22/00	# 4 12/06/00	# 5 7/23/02	# 6 8/6/02	# 7 9/25/02
Corrugated Cardboard	227.6 21.4 %	286.3 22.9 %	—	—	1,462.3 34.5 %	1,138.5 34.5 %	1,140.9 28.1 %
ONP, phone books, magazines	222.4 20.9 %	313.3 25.1 %	—	—	513.0 14.7 %	742.5 22.5 %	1,490.0 36.7 % *
Office paper	216.4 20.4 %	328.8 26.3 %	—	—	883.0 25.3 %	871.2 26.4 %	885.1 21.8 %
Containers (plastic, tin, aluminum and glass)	89.3 8.3 %	27.4 2.2 %	—	—	373.4 10.7 %	336.6 10.2 %	365.4 9.0 %
SUBTOTAL recyclables	755.7 71.1 %	955.8 76.5 %	920.0 95.8 %	850.0 93.4%	3,231.7 92.6 %	3,088.8 93.6 %	3,881.4 95.6 %

Non-recyclables	307.2 28.9 %	293.6 23.5 %	40.0 4.2 %	60.0 6.6 %	258.3 7.4 %	211.2 6.4 %	178.6 4.4 %
TOTAL	1,062.9 100.0 %	1,249.4 100.0 %	960.0 100.0 %	910.0 100.0 %	3,490.0 100.0 %	3,300.0 100.0 %	4,060.0 100.0 %

*18% was phone book due to annual book collection

When subsequent setout observations were made, any contamination was reported to the business. Periodic checks of setouts, fullness and contamination found that fullness of the blue barrels was 67% full in October 2000 and 87% full in January 2001. By April some businesses had requested a second barrel, stating that every other week was not frequent enough to handle their recyclables. To quantify this need an audit was done on the garbage set out on April 9th 2001 before the recycling pickup day. The audit showed that from a 1,193 pounds sample, 20% by weight (239.2 pounds) and 28% by volume (442 gal.) of the garbage was recyclables. Once per week collection began before the pilot was expanded in June 2001.

Graph 1. Percentage of non-recyclables



Inspections of setouts over time produced interesting results. Businesses in Tucson follow a markedly seasonal pattern, as consequence of a large influx of winter visitors, as well as thousands of students and whole families moving out for the summer. This cyclic pattern was disrupted by the events of September 11, 2001 and their aftermath, (decline in tourism and generalized economic downturn) which took a heavy toll in the realm of small business, with a very strong effect on the revenues of the City of Tucson. Within this larger perspective, it was a top priority to increase the efficiency of the collection and disposition of both garbage and recycling,

In order to implement a successful modernization of these services, the staff involved with the Small Businesses Project had as a top priority the acquisition of data, which accurately reflect the participation of the pilot businesses.

Convenience is a key factor for the success of recycling programs. Customers of any solid waste hauling service react primarily to either having or not having enough room for the items to be disposed of. Unless excessive, weight of the garbage or the recyclables seldom is a factor in the subjective perception of the user friendliness of a system. For these reasons, and although each load was weighed upon its arrival to the MRF, the primary statistical analysis for setout patterns was done in volumetric terms, i.e., by assessing fullness.

The statistical information was gathered through the observation of the Blue Barrels just at the time when the sideload collection trucks arrived to service the containers. The criteria utilized by the observers were the same ones used by industry and research organizations, allowing for direct comparison with similar studies.

The four variables observed and their ranges were:

- a) Set out (Y / N)
- b) Fullness of the Blue Barrel(s) set-out for collection (0% = empty to 110% for overfull)
- c) Contaminants (i.e., non-recyclables) present in any amount (N/Y)
- d) Serviceability (Y/N) combines accessibility to the truck's gripper arm and tolerable contamination

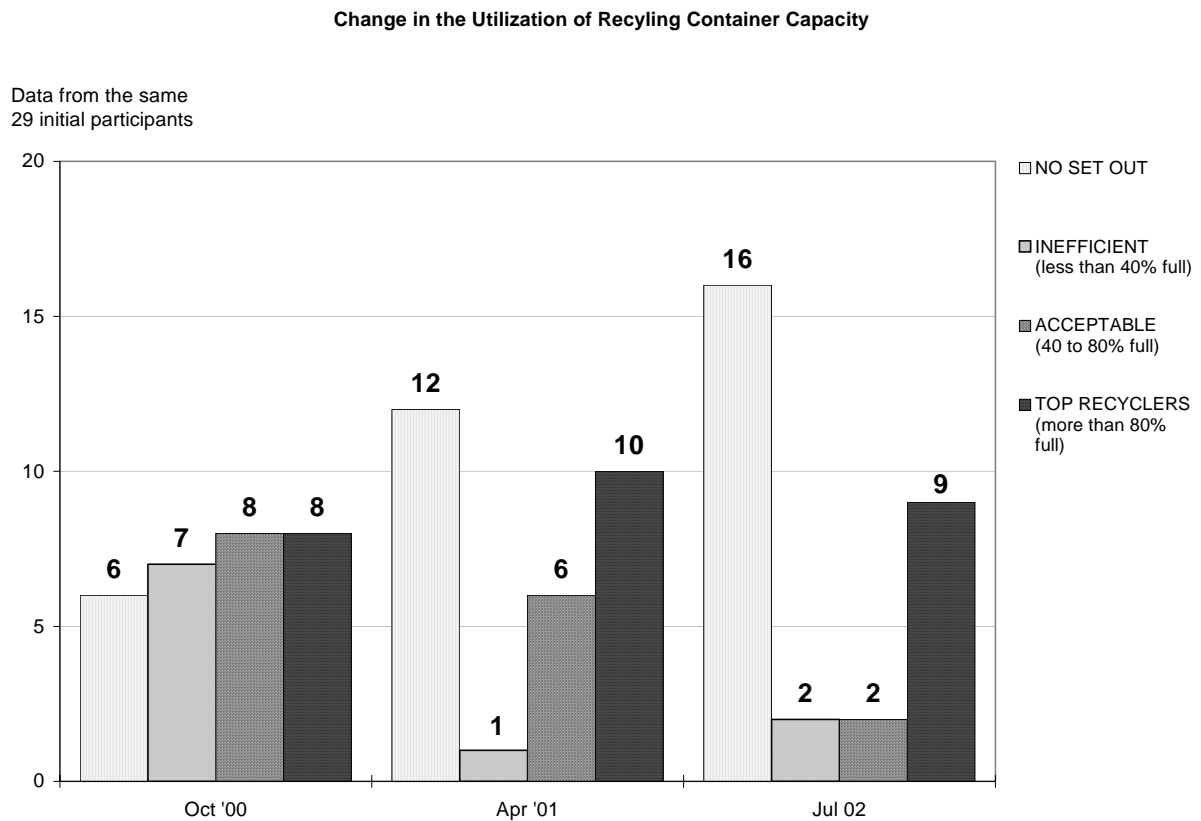
When a participant had more than one Blue Barrel

- the fullness reported is the arithmetic mean of the containers set out for collection and
- contamination (non-recyclables), when observed, was reported the same (Y), whether one or more Blue Barrels had any. When contamination was reported to the businesses they were eager to remedy the situation.

The data from the initial 29 participants' recycling containers was collected on four opportunities:

- twice the first month (Oct. 2000) and
- twice five months later (Mar. and Apr. 2001).

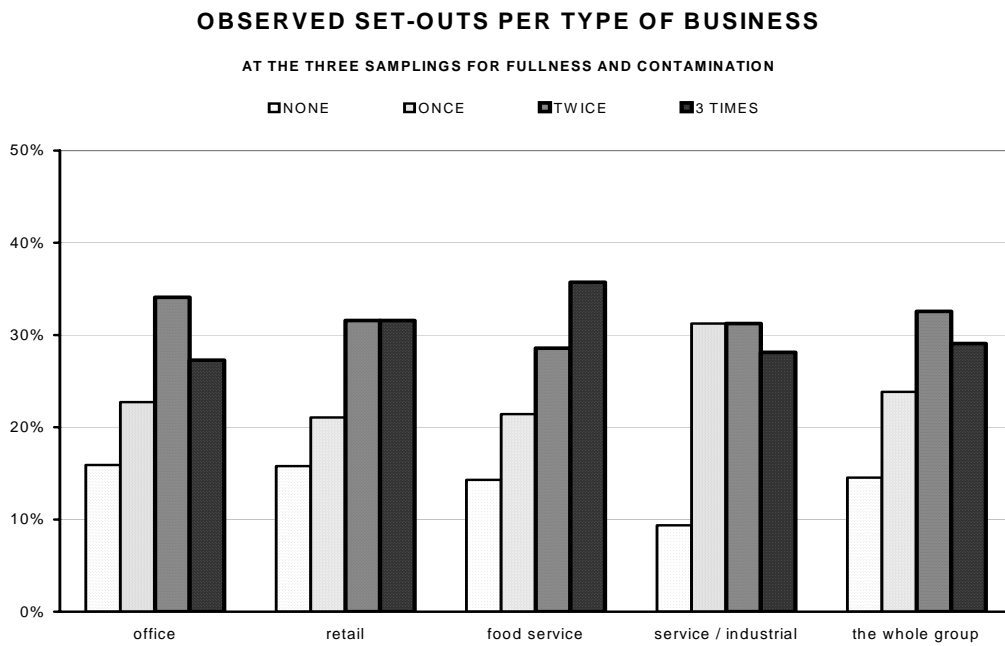
Graph 2. Initial 29 Businesses Setout Tracking



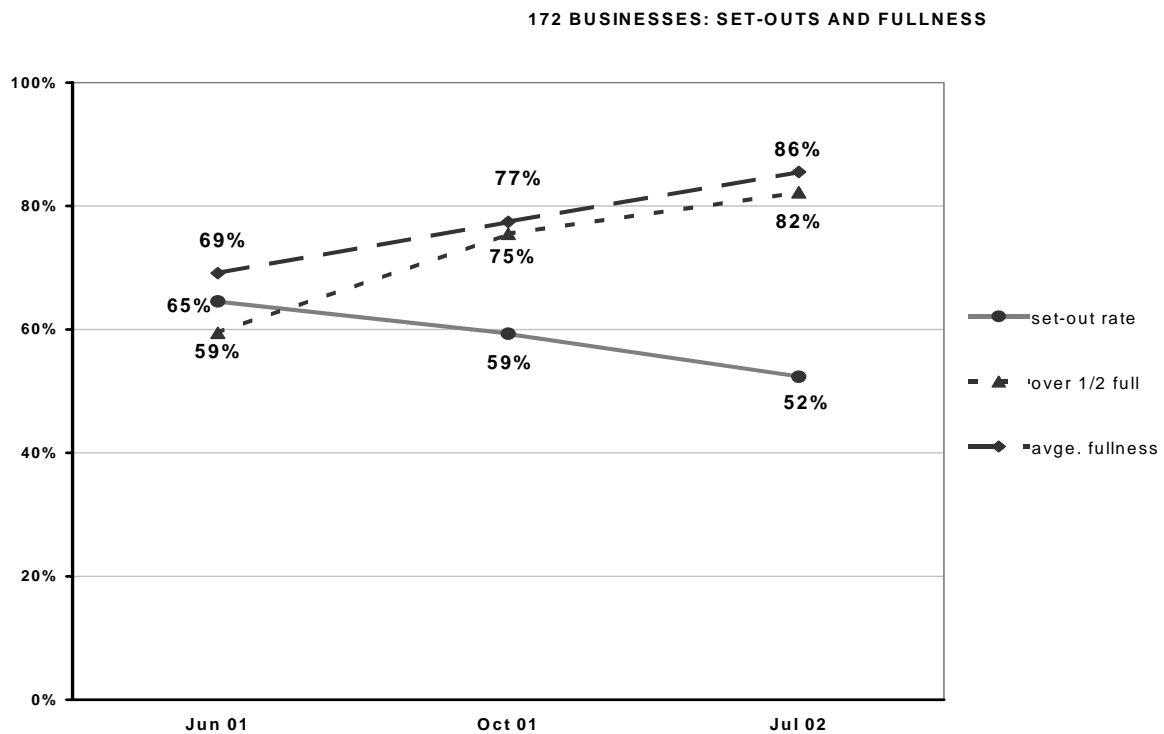
The data from the expanded group (172 participants) was collected three times:

- at the beginning (June 2002),
- midway through the project but before the Christmas seasonal business peak (Oct. 2002), and
- at the end of the project, when the whole city was beginning its transition to once-a-week garbage and once-a-week recycling (March and April, 2002).

Graph 3. Participation per type of business



Graph 4. Expanded Group Set-outs Tracking



Data gathering was independent of the customer-service oriented contacts

From the data gathered and summarized in the accompanying tables and graphs:

PARTICIPATION, i.e., utilization of the service, was quite consistent through the whole project, both in the pilot stage and later on the expanded group.

SETOUTS vs. FULLNESS: The decrease of setout rates actually is a positive result, because it closely matches the increase in fullness averages. From the service provider's perspective, it means, "more recyclables lifted per stop", i.e., a net increase in efficiency. This phenomenon also indicates that customers realize the importance of setting out the container "when it is more than half full and there is not enough room for next week recycling". (Graphs 2, 3, and 4, Table 4).

CONTAMINATION (i.e., non-recyclable materials in the recycling container) closely reflects the characteristics of the participating business.

Those with a higher rate of "trash generators" indicate both a need to reinforce education of the workforce and also to increase the awareness of the persons with access to the recycling containers. The nature of the main contaminants (plastic bags, food leftovers and non-recyclable plastics) indicates two generalized perceptions:

- a) Awareness of litter as something to be avoided, which is good, and
- b) Insufficient understanding of the fact the "recyclables are NOT trash", resulting in the use of the recycling container as a "trash" container.

Overall reduction in contamination of recyclables is reflected in Graph 1.

WASTE DIVERSION. After overcoming the learning curve with the initial 29 participants in the pilot stage, the economic circumstances described above can be appreciated in the following data in **Table 4**, obtained from the 172 participants through one full year of weekly collections:

Table 4. Setout observations data.

	July – Sep	Oct – Dec	Jan – Mar	Apr – June	One Year
	2001	2001	2002	2002	Average
Whole Route					
Yield per Week	2,919	3,492	3,277	3,337	3,256
(pounds)					
Individual Business					
per week	17.0	20.3	19.1	19.4	18.9
(pounds)					
Set – out rate	64.5 %	59.3 %	52.3 % (*)		
Fullness	69 %	77 %	86 % (*)		
Contaminated but					
serviceable set-outs	22.5 %	17.6 %	22.2 % (*)		
Contamination as	25 %	(Oct. '00)		5 %	(Sep. '02)
weight of loads					

(*) Data from observations on the last collection of March and the first collection of April.

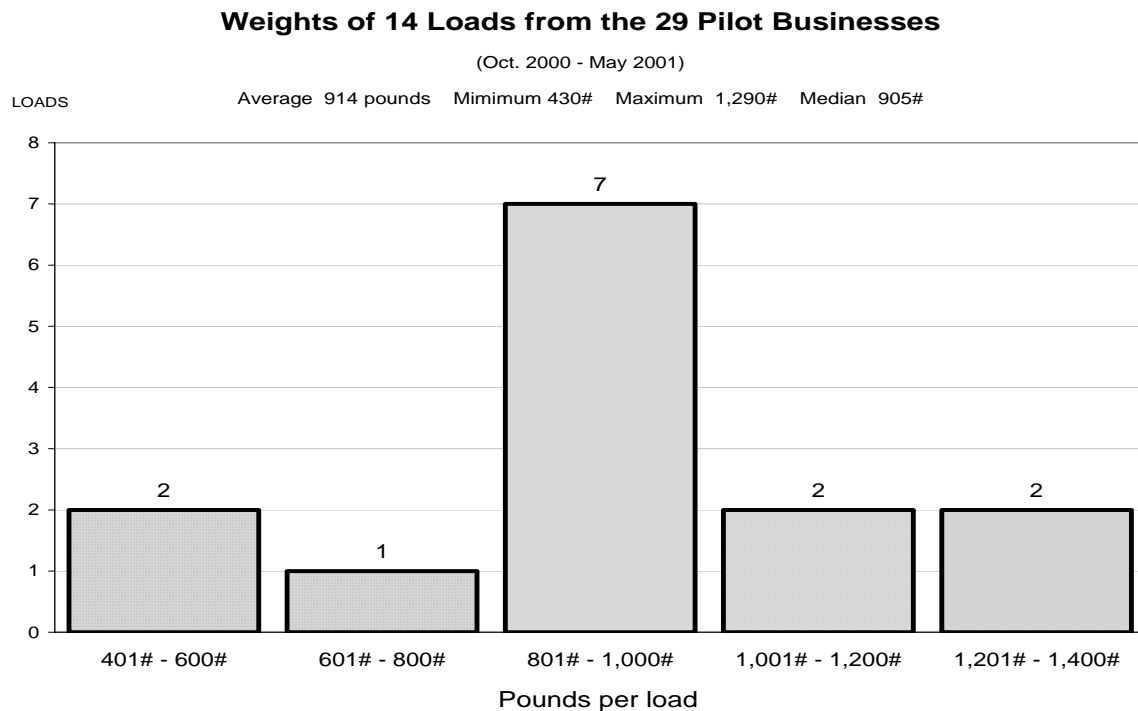
The learning curves observed with both the Pilot group and the expanded group are quite similar. Both groups learned rather quickly that it does not make any sense setting out containers less than half full, when there is enough room for next week's recycling.

This learning process had three components:

- 1) The justification to move citywide to once-a-week garbage, as evidence showed that on the second garbage collection of the week, the containers often were less than half full (“lifting air”) – the same logic works for recycling containers!
- 2) The perception that “Recycling is clean – not like garbage”
- 3) The reinforcing effect of individual contacts and word-of-mouth information sharing.

The statistics show that, in order for a new system to succeed, it is essential to educate business owners and employees in communities and businesses with a high turnover rate. Leading by example is the most practical way to educate those who actually generate and remove the recyclables.

During pilot phase one (Oct. 2000 – June 2001), the 29 businesses recycled about 1,000 pounds per every two weeks collection for a 20-month total of 9.9 tons. Contamination was over 20% in the first two weeks, but it quickly decreased to between 4% - 7% after contacting the businesses.

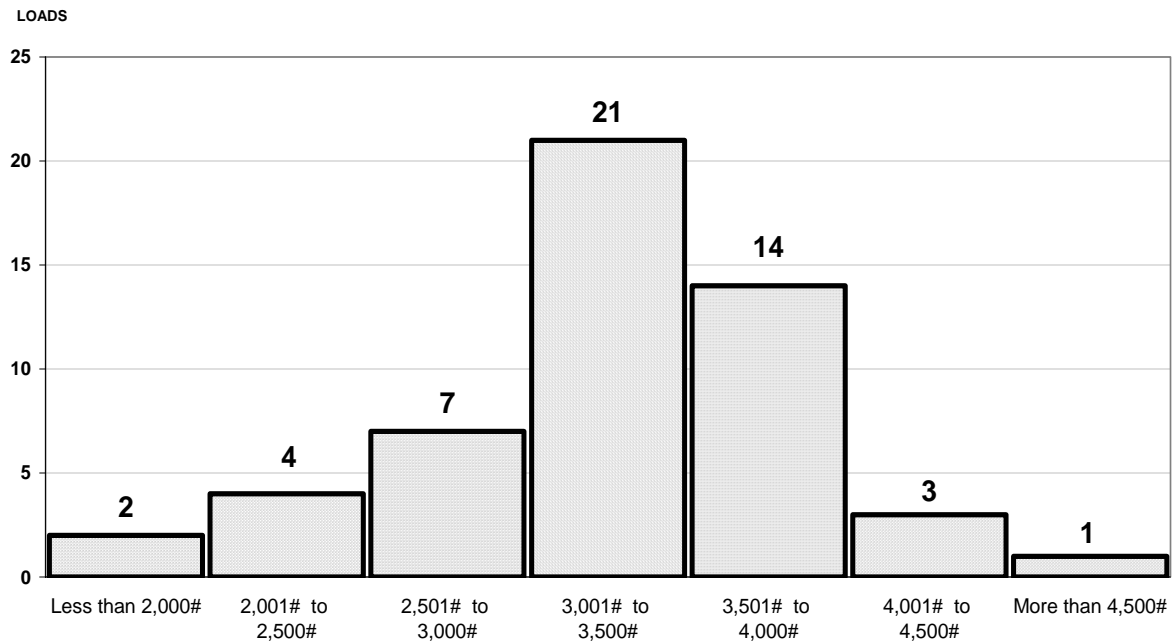


When collection was changed to once per week and the number of businesses was expanded to 172, an average of 3,256 pounds per week was recycled. This total was 84.7 tons in 12 months.

Weight of the 52 Loads Delivered to the MRF by 172 Small Businesses

(July 03, 2001 - June 25, 2002)

Average 3,256 pounds min. 1,420 pounds max 5,290 pounds



Transition to Citywide Blue Barrel

The blue barrel deployment citywide which originally had been planned for 2002 was delayed for the small business pilot area until late 2003. At this time all small businesses in the City with APC service went from twice per week garbage to once per week garbage and once per week recycling. We found that some non-pilot businesses had some difficulty with the transition, almost no pilot businesses had problems, as they were well along with recycling.

Greenhouse Gas Emission Reduction

This project was funded in part with U.S. EPA Climate Change Action Plan funding to reduced greenhouse gas emissions associated with the solid waste. EPA created the Waste Reduction Mode (WARM) to help solid waste planners and organizations track and voluntarily report greenhouse gas emissions reductions from different waste management practices. WARM is available both as a Web-based calculator and as a Microsoft Excel spreadsheet at:

<<http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsWasteWARM.html>>

WARM calculates and totals GHG emissions of baseline and alternative waste management practices—source reduction, recycling, combustion, composting, and landfilling. The model calculates emissions in metric tons of carbon equivalent (MTCE), metric tons of carbon dioxide equivalent (MTCO2E), and energy units (million BTU) across a wide range of material types commonly found in solid waste.

Project Emission Reductions

The following figures utilize EPA’s Waste Reduction Mode (WARM) calculator based on actual project recycling rates (below) for different materials.

Material	Carbon Equivalent Diverted (Metric Tons)	CO2 Equivalent Diverted (Metric Tons)	Energy Use Saved (Million BTU)
Cardboard	1	5	29
Mixed Paper	1	4	14
Office Paper	1	5	33
Recyclable Containers	0	2	27
TOTALS	3	16	103

Project Recycling Totals from Audits

Material Breakdown	Audits 1,2,5,6,7 (Sorted)	Audits 3,4 (Unsorted)*	Totals (Tons)
Cardboard	4254.7 lbs	582 lbs	2.15
MP	3281.2	556	1.71
Office Paper	2857.5	449	1.47
Containers (plastic, tin, aluminum & glass)	1192.1	178	0.61

* Unsorted break downs based on mean of sorted recycling percentages from 5 other collection days

Program Emissions Reduction Potential

The project is projected to divert an estimated **1032 tons per year** of recyclables. This level of waste diversion would result in the following greenhouse gas emission reductions:

Carbon Equivalent Diverted (Metric Tons)	CO2 Equivalent Diverted (Metric Tons)	Energy Use Saved (Million BTU)
806	2,954	18,665

Project Emission Reduction Equivalency Information

In an effort to communicate Tucson's project reductions and potential reductions in terms that are easier to conceptualize, equivalency data was run.

U.S. Climate Technology Cooperation Gateway
<http://www.usctcgateway.net/tool/>

Idaho Power: "The Power is Yours"
<http://www.idahopower.com/pdfs/energycenter/energyPlan.pdf>

The impacts of Tucson's Small Business Recycling Program include:

- The emissions reduction from Tucson's 5 day collection was the equivalent of 3 cars not being driven for one year.
- The emissions reduction from Tucson's 5 day collection was the equivalent of 2 households' energy use for a whole year.
- The potential emissions reductions from a citywide recycling collection system is the equivalent of 639 passenger vehicles not driven for a whole year.
- The potential emissions reductions from a citywide recycling collection system is the equivalent of 2,462 acres of forest not being cut down.
- The potential energy savings from a citywide collection system is the equivalent to 12,662 TVs not being used for a year.

Exit Interviews Summary

At the close of the pilot project participant exit interviews were conducted. Participants were asked about their reasons for participating, their views on what worked and what didn't, and their perceptions on the effectiveness of the program. Responses were very positive, but did indicate some minor problem areas. Since participation in the program was voluntary, it is not surprising that people cited environmental and civic responsibility as the motivating factors behind their involvement. Participants probably also came on board with positive expectations for the project, and an ineffective or problematic delivery of the project might have created negative responses in those people. We were very happy to note that slightly better than 99% of the participants finished the project with a positive opinion of it. Still, no project runs without a few hitches, and participants noted some difficulties, primarily in the early days of the project, with reliability of pickups, scheduling of pickup days, and a little confusion over which materials could be recycled. We had expected that recognition and publicity for being part of the program might be a motivating factor for businesses to participate, but interviews indicated that little effort was made on the part of the businesses to advertise their involvement. However, in those cases where customers knew of a business' participation, customer

response was favorable. Materials recycled by the businesses varied, but with some trends standing out. When the types of businesses were compared to each other, it was noted that office, retail and service/industrial businesses had approximately the same materials profile, while food service businesses were much lower in paper production and higher in plastics. For all but office-type businesses, corrugated cardboard was the most common recycled material. For offices, not surprisingly, office paper rated higher than cardboard. When asked about the level of participation (frequency of setouts, fullness of barrels), participants routinely overestimated their own actions. They “remembered” setting barrels out more frequently and fuller than recorded observations by the drivers of the trucks would support. This is most likely a function of their enthusiasm for the program and their desire to be seen as doing their part.

Although at the end of the project some of the people interviewed didn’t remember exactly why they volunteered to participate in the program, or even realized that they had volunteered, most did have fairly strong reasons for participating. More than half of those interviewed cited commitment to environmental interests in general or recycling in particular as their motivation. Some of the comments made include:

- “A strong belief in the good recycling does for the environment.”
- “A burning desire to recycle as much as possible.”
- “Civic responsibility for the benefit of future generations.”
- “We are a school that promotes environmental education and strongly believe in recycling.”
- “Recycling is one of the Solar Store’s core values.”

It also seems that simply being invited to participate in a program was enough to motivate some businesses. Approximately 15% of those interviewed indicated that the primary reason they signed on was because they were asked.

Several participants cited convenience, with statements such as:

- “Previous to the pilot project I was making weekly runs to the local recycling center (Columbus Park). With the promise of curbside pickup that was no longer necessary.”
- “My family strongly supports recycling and having it available in this way has made it easy and productive for our business.”

Perhaps less inspirational but notably effective were those whose reason for participating was because a boss or supervisor mandated it. A small percentage of people involved simply inherited the project and continued the participation when a previous owner sold the business to them.

Perhaps one of the most enjoyable aspects of the pilot project was going around to the businesses at the close of the project to conduct exit interviews. People overwhelmingly liked the project, and the interviewer commented that he had never had a job before where he had been so consistently welcomed into people's worksites or offices and thanked and congratulated. Less than 1% of the people interviewed had a negative opinion of the pilot project, and it turned out that the negative opinion was based on false information about the program. When asked their opinions of the pilot project, most respondents provided one- or two- word answers, such as "Great" or "Loved it", but a few elaborated. Examples include:

- "Great. Very much needed for small businesses. We used the service a lot."
- "For me it has been a total success. It saves me money as I do not have to pay for a larger trash barrel, and more importantly it's the right thing to do."
- "Great, makes us feel like we are doing something for our environment."
- "Wonderful, helpful, very smart way to get recycling to happen in a larger city."
- "Great – more businesses should participate! I feel much better putting everything I can into the recycling bin instead of the trash – worth the effort."

Inevitably, there are problems in the implementation of a new program or project. It is through recognizing these problems that improvements can be made and future projects can be better designed. The exit interviews included questions about problems with the pilot project, and with the transition to once-per-week trash pickup that accompanied the implementation of the recycling program. Overall, the responses were very positive.

It was hoped that the ability to recycle would diminish the need for trash pickup, and that seems to have been the case. The reduction in trash pickup was not offered on a voluntary basis, and was expected to generate negative reactions. However, more than 80% of the people interviewed stated they had no problems with the reduction of trash pickup. About 16% had "some difficulty" with the transition, and only about 2.5% found the transition "very difficult".

When asked what problems were encountered with the pilot project, just fewer than 70% of the interviewees said "none". The remainder fell in three categories. Several people complained that recycling pickups were missed on several occasions, especially at the start of the program. Several people indicated that they were confused about their pickup schedule (or changes in it). A few indicated problems with educating their employees (or even themselves) in regards to exactly which materials could be recycled.

One factor that could contribute to a business wanting to participate in a recycling program would be the good publicity that the business might incur if its customers were aware of the participation. However only 30% of the businesses thought their customers were aware of the business' participation in the program, and many of those indicated that only some or a few customers knew about it.

However, of the ones whose customers were aware, they all indicated that they got positive responses from the customers. Examples of comments from businesses whose customers were aware are:

- “A very few [were aware], and they were surprised and pleased.”
- “Yes, they think it’s great. They even recycle at my salon – they know which is the recyclable can and which is trash!”
- “Yes -we posted notices and talked it up. We continue to do so.”
- “They thought that we were doing a good thing for the city and the environment. Some brought items to put in the bin.”

In general it appears that motivation to be involved in the program, while perceived in a positive light by the community, was due to internal commitment rather than external recognition.

The range of commodities accepted in the pilot project has been spelled out in detail in another section of this report, so won’t be repeated here. Instead, the exit interview focused on finding out which materials were most frequently placed in the recycling bins, and if there were trends in which types of businesses recycled which types of commodities. Many individual businesses reported only recycling some of the materials on the list – some as few as just one commodity. Only 16.8% indicated that they recycled all categories of commodities. Corrugated cardboard was the most commonly recycled material, and all types of businesses placed it high on their lists. As would be expected, offices generated the highest levels of office paper, and food services generated the highest levels of plastic bottles (and the lowest levels of office paper and junk mail). Otherwise, most businesses were pretty much similar in what they claimed to recycle.

Quantities of materials received for recycling have been described in other parts of this report, but in the exit interview we wanted to determine what the participants’ perception was of how much they recycled. Not surprisingly, they tended to over estimate the volume of recyclable materials they produced, and the frequency at which they contributed it to the pickup schedule. Participants were asked to estimate how often they placed barrels out for pickup, and how full they were. This was compared to observed pickups checked at intervals and recorded by the ES staff and contractor who collected data on the blue barrels. While staff observed a 68% setout rate, participants estimated an 88.7% setout rate. While staff recorded a 69% fullness rate, participants estimated a 91.4% fullness rate. Perhaps the best explanation for the discrepancies is that people felt very positive about their role in the program and in their own minds exaggerated their part in it.

Recommendations

Recruiting of voluntary participants may not always be an option when setting up a program, but to do it this way during the introductory or pilot phase of a program has strong advantages. It starts the program on a positive note, and gets good publicity that helps sell it to the rest of a community, and allows bugs to be worked out among people inclined to be cooperative.

Scheduling of pickup days should be well thought out before the program launches. Changes in schedule cause confusion and irritation among participants. However, if schedule changes must be made, efforts must be made to assure that all participants understand the changes.

Participants should be provided with clear, understandable lists of materials that can be recycled. It may help to have durable (laminated?) lists that business can post for their employees.

Special efforts might be required to make sure that drivers are picking up all the setout barrels when scheduled. This is particularly important in the first weeks of the program, when drivers might have the hardest time learning the route and participants are most likely to become discouraged.